Modal Profiles: 1990

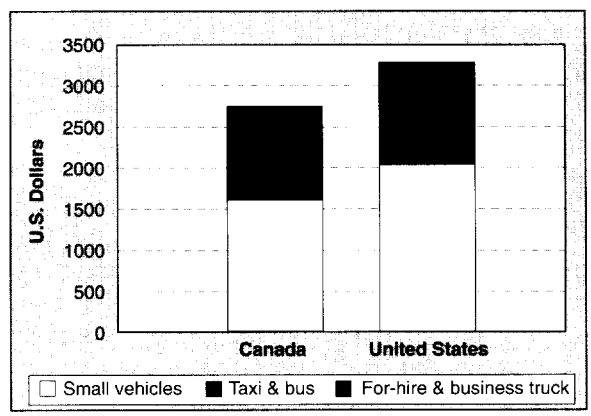
This section presents an overview of each of the main modes of transportation—highway, aviation, rail, water, and transit—for each of the North American countries. The most recent year for which some comparable data items exist is 1990; consequently, these modal profiles are for that year. (Trend analyses by mode and country for the years 1987 to 1991 are in the following section of this report.) In general, available 1990 transportation data are limited for Mexico; therefore, data on Mexico have not been included here. In some cases, data have been estimated (see appendix A for a discussion of how these estimates were derived); in other cases, where a lack of information precluded development of estimates, no data have been provided for the particular variable.

Highway

The highway mode consists of public roads and streets; automobiles, vans, trucks, motorcycles, and buses[1] operated by transportation companies, other businesses, governments, and households; garages, truck terminals, and other facilities for motor vehicles.

Highway Bill. For both the United States and Canada, most national transportation expenditures are made for highway transport of people and freight. Canadian highway expenditures per capita in 1990 were $3,126, about 89 percent of the U.S. per capita figure of $3,517. (See figure 3 and table 17.) Highway expenditures—the highway bill—can be grouped into several major categories, including vehicle capital and operating costs for autos and small trucks, amounts spent on for-hire truck services, expenditures for operating business trucks (private trucking), expenditures for purchased passenger services of highway vehicles (taxis and buses), and amounts spent for highway construction and upkeep. The key expenditure category in both Canada and the United States is the capital and operating cost of small vehicles: this was $43 billion in 1990 in Canada (52 percent of that country's entire highway bill) and $518 billion in the United States (59 percent).

Figure 3. Highway bills per capita



Canada and the United States differ in their highway expenditures in several respects. Canada spends substantially more on bus transit ($128 per person) than does the United States ($36); Canadian government support for transit buses is also more ($42 per person versus $24). Similarly, Canada spends $13 per person on intercity buses; the United States spends only $7.50.

On the other hand, some major items in the countries' highway bills are markedly similar. For-hire trucking receipts were almost $11 billion in Canada, or 13 percent of the highway bill. In the United States, the figure was $117.5 billion, also about 13 percent. (Per capita expenditures in the two countries for for-hire trucking are $407 in Canada and $470 in the United States.) Business truck expenditures in Canada were $14 billion, or 17 percent of the highway bill; the corresponding U.S. figure was $157 billion, or about 18 percent. (Per capita expenditures are $530 in Canada and $630 in the United States). Canadians spends $19 per person on taxis and $31 on school buses: the United States spends $23 and $30, respectively.

Table 17 Total and per Capita Highway Bills: 1990

	Millions of U.S. Dollars			Millions of Canadian Dollars		
	Canada	U.S.	Total	Canada	U.S.	Total
Highway Bill:	83,139◄	879,281	962,420◄	97,022◄	1,026,121	1,123,143◄
Small vehicles	42,857	518,026	560,883	50,013	604,537	654,550
Capital Costs	18,153	215,800	233,953	21,184	251,839	273,023
Operating Costs	24,704	302,226	326,930	28,829	352,698	381,527
Taxi revenue	505	5,818	6,323	589	6,790	7,379
School bus expense	823	7,605	8,428	960	8,875	9,835
Intercity bus revenue	346	1,876	2,222	404	2,189	2,593
Other bus revenue	144	1,321	1,464	168	1,541	1,709
Bus transit revenue	3,404	8,903	12,307	3,972	10,390	14,362
For-hire truck revenue	10,826	117,511	128,337	12,634	137,135	149,769
Business truck expense	14,097	157,354	171,451	16,452	183,632	200,084
Government highway expenditures	5,860◄	60,867	66,728◄	6,839◄	71,032	77,871◄
Additional government highway revenues	4,277◄	0	4,277◄	4,991◄	0	4,991◄

	U.S. Dollars			Canadian Dollars		
	Canada	U.S.	Total	Canada	U.S.	Total
Highway bill per capita	2,745.0	3,275.0	3,224.0	3,203.0	3,823.0	3,762.0
Small vehicles	1,611.1	2,072.9		1,880.2	2,419.2	
Capital costs	682.4	863.5		796.4	1,007.8	
Operating costs	928.7	1,209.4		1,083.8	1,411.4	
Taxi revenue	19.0	23.3		22.1	27.2	
School bus expense	30.9	30.4		36.1	35.5	
Intercity bus revenue	13.0	7.5		15.2	8.8	
Other bus revenue	5.4	5.3		6.3	6.2	
Bus transit expense	128.0	35.6		149.3	41.6	
For-hire truck revenue	407.0	470.2		475.0	548.8	
Business truck expense	530.0	629.7		618.5	734.8	

◄ Denotes estimate

Both the Canadian and U.S. governments provide substantial financial support to their countries' highways. The $6 billion spent by the Canadian government is 7 percent of the highway bill and $220 per person; U.S. support is also about 7 percent and is $226 per person. However, Canadian governments collect $10.1 billion, or $381 per person, from highway users. U.S. collections are $61 billion, or $226 per person. In Canada, the user fee receipts exceed the amounts expended on highways by $4.3 billion. In the United States, payments exceed revenues by $7.9 billion.

Extent of Public Roads. The United States has over six million kilometers (almost four million miles) of public roads. (See tuble 18.) Canada, with a land area roughly the size of the United States, contains 22 percent as much public road distance. However, in relation to its far smaller population. Canada has over twice as much public road distance as does the United States.

Table 18 Extent of Public Roads: 1990

	U.S. Miles			Kilometers		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	853,490	3,880,151	4,733,641	1,373,496	6,244,208	7,617,704
Major highways	5,786	55,648	61,434	9,312	89,553	98,865
Other paved	221,273	2,203,497	2,424,770	356,088	3,546,020	3,902,108
Unpaved	626,431	1,621,006	2,247,437	1,008,096	2,608,635	3,616,731
	U.S. Miles/Million Population			**Kilometers/per Million Population**		
	Canada	U.S.	Total	Canada	U.S.	Total
Total public	32,086	15,527	17,120	51,635	24,987	27,550
Major highways	218	223	222	350	358	358
Other paved	8,319	8,818	8,770	13,387	14,190	14,113
Unpaved	23,550	6,487	8,128	37,898	10,439	13,080

A very small proportion of Canadian or U.S. public roads are multilane and of a high capacity (such as the U.S. Interstate Highway System) suited for large volumes of traffic. These major highways constitute only about 1 percent of U.S. facilities and about 7 percent of Canadian. Many public roads—73 percent of Canada's and 42 percent of those in the United States—are narrow; unpaved; have soil, gravel, or stone surfaces; or nonsurfaced.

Number of Vehicles. There are over 200 million highway vehicles registered in Canada and the United States combined. (See table 19.) This total averages to 76 vehicles per 100 people—slightly more in the United States (77) and slightly less in Canada (64). The two countries follow a similar pattern in terms of registered trucks and cars: there are fewer per capita of every kind of vehicle in Canada than in the United States. In the overall category of highway buses, the per capita numbers are nearly identical for the two countries. However, the United States has about twice as many school buses per capita as does Canada, and far fewer buses in every other classification.

In addition to the on-road vehicles listed in the table, some Canadian provinces register snowmobiles and powered farm and construction equipment. In 1990, there were 630,000 snowmobiles registered, or about twice the number of motorcycles as were registered in Canada.

Table 19 Highway Vehicles: 1990

	Number			Vehicles/Million Population		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	16,953,190	193,057,376	210,010,566	637,338	772,539	759,532
Cars	12,622,038	143,453,040	156,075,078	474,513	574,042	564,467
Motorcycles	331,075	4,259,462	4,590,537	12,446	17,045	16,602
Straight trucks	3,848,832	43,477,578	47,326,410	144,693	173,980	171,162
2-Axle, 4-Tire	3,579,579	38,863,550	42,443,129	134,571	155,516	153,501
Other	269,253	4,614,028	4,883,281	10,122	18,463	17,661
Truck-tractors	87,283	1,240,309	1,327,592	3,281	4,963	4,801
Buses	63,962	626,987	690,949	2,405	2,509	2,499
Transit	10,931	59,753	70,684	411	239	256
School	29,897	508,261	538,158	1,124	2,034	1,946
Intercity	3,717	19,491	23,208	140	78	84
Other buses	31,301	23,260	54,561	1,177	93	197

Highway Vehicle Use. The average distances traveled by a highway vehicle in Canada and in the United States are very similar—about 18,500 kilometers (11,500 miles), although automobiles in Canada travel about 4 percent farther than does the average U.S. car. A significant difference exists, however, in truck travel comparisons. The U.S. distance for straight trucks is about 17 percent greater than the Canadian, the U.S. distance for truck-tractors is about 22 percent more. (See table 20.)

The amount of highway travel per capita was estimated for Canada using U.S. vehicle occupancy rates. (See table 21.) The estimate suggests an average person-miles of highway use of 12,000 in Canada and 14,000 in the United States.

Table 20 Highway Vehicle-Distances: 1990

	Miles, Millions			Kilometers, Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Vehicle-Distance	192,418	2,243,909	2,436,327	309,600	3,610,450	3,920,050
Cars	138,193	1,513,184	1,651,377	222,353	2,434,713	2,657,066
Motorcycles	743◄	9,557	10,300	1,195◄	15,377	16,573
Straight trucks	46,644	615,892	662,536	75,051	990,970	1,066,021
Truck-tractors	5,559	96,367	101,926	8,944	155,055	163,999
Buses	1,278	8,909	10,187	2,057	14,335	16,392
Transit	383	2,153	2,536	616	3,465	4,081
School	302	4,962	5,264	486	7,983	8,469
Intercity	250	1,244	1,494	402	2,002	2,404
Other buses	344◄	550◄	893◄	553◄	884◄	1,437◄

	Miles per Capita			Kilometers per Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Vehicle-Distance	7,234	8,979	8,811	11,639	14,448	14,177
Cars	5,195	6,055	5,972	8,359	9,743	9,610
Motorcycles	28◄	38	37	45◄	62	60
Straight trucks	1,754	2,465	2,396	2,821	3,965	3,855
Truck-tractors	209	386	369	336	620	593
Buses	48	36	37	77	57	59
Transit	14	9	9	23	14	15
School	11	20	19	18	32	31
Intercity	9	5	5	15	8	9
Other buses	13◄	2◄	3◄	21◄	4◄	5◄

	Miles per Vehicle			Kilometers per Vehicle		
	Canada	U.S.	Total	Canada	U.S.	Total
Vehicle-Distance	11,350	11,623	11,601	18,262	18,701	18,666
Cars	10,949	10,548	10,581	17,616	16,972	17,024
Motorcycles	2,244◄	2,244	2,244	3,611◄	3,610	3,610
Straight trucks	12,119	14,166	13,999	19,500	22,793	22,525
Truck-tractors	63,688	77,696	76,775	102,475	125,013	123,531
Buses	19,986	14,209	14,744	32,157	22,863	23,723
Transit	35,045	36,038	35,885	56,387	57,986	57,738
School	10,102	9,762	9,781	16,254	15,707	15,737
Intercity	67,171	63,847	64,379	108,078	102,730	103,586
Other buses	10,976◄	23,629◄	16,370◄	17,661◄	38,018◄	26,340◄

◄ Denotes estimate

Table 21 Highway Person-Distances: 1990

	Person-Miles, Millions			Person-Kilometers, Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	320,564◄	3,613,105	3,933,669	515,787◄	5,813,486	6,329,273
Cars	240,169◄	2,629,796	2,869,965	386,433◄	4,231,341	4,617,774
Motorcycles	1,085◄	13,953	15,038	1,745◄	22,451	24,196
Straight trucks	59,885◄	757,242	817,127	96,354◄	1,218,402	1,314,757
Truck-tractors	5,559◄	96,367	101,926	8,944◄	155,055	163,999
Buses	13,866◄	115,747	129,613	22,310◄	186,237	208,547
Transit	3,758◄	21,127	24,885	6,047◄	33,993	40,040
School	3,866◄	63,509	67,375	6,220◄	102,186	108,406
Intercity	6,242◄	31,111	37,353	10,043◄	50,058	60,101
	Person-Miles per Capita			**Person-Kilometers per Capita**		
	Canada	U.S.	Total	Canada	U.S.	Total
Average Total	12,051◄	14,458	14,227	19,390◄	23,263	22,891
Cars	9,029◄	10,523	10,380	14,528◄	16,932	16,701
Motorcycles	41◄	56	54	66◄	90	88
Straight trucks	2,251◄	3,030	2,955	3,622◄	4,876	4,755
Truck-tractors	209◄	386	369	336◄	620	593
Buses	521◄	463	469	839◄	745	754
Transit	141◄	85	90	227◄	136	145
School	145◄	254	244	234◄	409	392
Intercity	235◄	124	135	378◄	200	217

◄ Denotes estimate

Highway Fuel Consumption. Available information on fuel consumption by highway vehicles shows that Canadian and U.S. vehicles use, on average, the same quantity of fuel—683 gallons per vehicle. (See table 22.) The average car driven by a Canadian consumes about 10 percent more fuel than the average car driven by a U.S. resident (554 gallons versus 505). U.S. trucks, both large and small, consume more fuel than do Canadian trucks; they also average more travel than their Canadian counterparts.

Almost all fuel used in highway travel is petroleum-based, mainly gasoline or diesel. Some alcohol fuels are consumed. Gasohol (an ethanol blend) constituted under 6 percent of U.S. consumption 1990 fuel consumption. A few U.S. vehicles are fueled by liquid natural gas; some are electric-powered. In Canada, propane or liquid natural gas is an important fuel for buses, accounting for over 4 percent of the fuel consumption of urban buses and about 16 percent of that of school buses.

Highway Employment. The number of persons employed in highway transportation activities are markedly similar in Canada and the United States when measured either as a proportion of total national employment (8½ percent in Canada and 8.3 percent in the United States) or in terms of the number of people employed in highway-related occupations per thousand population (40 in Canada and 39 in the United States). In both countries combined, nearly 11 million people—one out of every 11 people in the countries' workforces—are employed in highway-related activities. (See table 23.)

These highway employees work in several broad categories of activity: highway vehicle operation, sales of vehicles and accessories, highway equipment manufacture, wholesale sales of vehicles and accessories, and highway construction/repair. The first category is the largest,

Table 22 Highway Fuel Consumption: 1990

	Annual Gallons Millions			Annual Liters Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Fuel	11,572	131,879	143,451	43,800	499,164	542,964
Cars	6,991	72,435	79,426	26,460	274,167	300,627
Motorcycles	15◄	191	206	56◄	725	781
Straight Trucks	3,197	40,479	43,677	12,102	153,215	165,317
Tractors	1,205	17,577	18,782	4,562	66,528	71,089
Buses	164	1,197	1,360	620	4,529	5,149
Transit	79	568	646	297	2,149	2,446
School	53	472	525	201	1,787	1,987
Other buses	32◄	157◄	189◄	122◄	594◄	716◄

	Gallons per Vehicle			Liters per Vehicle		
	Canada	U.S.	Total	Canada	U.S.	Total
Fuel per Vehicle	683	683	683	2,584	2,586	2,585
Cars	554	505	509	2,096	1,911	1,926
Motorcyles	45◄	45	45	170◄	170	170
Straight Trucks	831	931	923	3,144	3,524	3,493
Tractors	13,808	14,171	14,147	52,262	53,638	53,548
Buses	2,562	1,908	1,969	9,697	7,224	7,452
Transit	7,182	9,500	9,141	27,185	35,957	34,601
School	1,773	929	976	6,711	3,516	3,693
Other buses	924◄	3,669◄	2,433◄	3,496◄	13,887◄	9,208◄

	Gallons per Capita			Liters per Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Fuel per Capita	435.0	527.7	518.8	1,646.6	1,997.5	1,963.7
Cars	262.8	289.9	287.3	994.7	1,097.1	1,087.3
Motorcycles	0.6◄	0.8	0.7	2.1◄	2.9	2.8
Straight Trucks	120.2	162.0	158.0	455.0	613.1	597.9
Tractors	45.3	70.3	67.9	171.5	266.2	257.1
Buses	6.2	4.8	4.9	23.3	18.1	18.6
Transit	3.0	2.3	2.3	11.2	8.6	8.8
School	2.0	1.9	1.9	7.5	7.2	7.2
Other buses	1.2◄	0.6◄	0.7◄	4.6◄	2.4◄	2.6◄

◄ Denotes estimate

accounting for 54 percent of the 9.8 million U.S. highway employees and 40 percent of those in Canada. Vehicle and accessory sales represents the second largest category of employment, accounting for 29 percent of U.S. highway employment and 24 percent of Canadian. The manufacture of cars and trucks is the next largest employment category. Although only 10 percent of the U.S. highway workforce is so employed, 21 percent of all Canadian highway workers are involved in this activity.

The final two categories are quite small in both countries, with wholesale sales of motor vehicles employing 5 percent of the workers in both Canada and the United States, and highway construction and repair accounting for 9 percent of the Canadian and 2 percent of the U.S. highway workforces. Although the numbers of people in this last category are small (about 300,000 for both countries combined), the large percentage difference is surprising. It could suggest relative expansion or improvement of the Canadian highway system, more use of capital

Table 23 Highway Employment: 1990

	Employment (thousands)			Percent of Total Highway Employment		
	Canada	U.S.	Total	Canada	U.S.	Total
Total Employment	1,068	9,777	10,844	100.00	100.00	100.00
Highway Transportation Equipment Manu.	227	985	1,212	21.25	10.08	11.18
Motor vehicles	51	315	365	4.76	3.22	3.37
Truck and trailer bodies	16	64	80	1.49	0.65	0.73
Motor vehicle parts & acc.	64	396	460	5.99	4.05	4.24
Highway & Bridge Construction & Repair	96	211	307	9.02	2.16	2.83
Highway Operations	431	5,274	5,705	40.37	53.94	52.61
Private trucking	217	2,738	2,955	20.30	28.01	27.25
For-hire trucking	105	1,590	1,696	9.86	16.27	15.64
Bus intercity and rural	4	24	28	0.35	0.25	0.26
Urban transit-Bus	39	162	201	3.62	1.66	1.85
School buses	31	579	611	2.93	5.93	5.63
Other bus	4	31	35	0.37	0.31	0.32
Taxis	21	33	54	1.97	0.34	0.50
14% Post Office Employment	10	115	126	0.97	1.18	1.16
Motor Vehicle & Acc. Wholesale	57	446	504	5.36	4.57	4.64
Motor Vehicle & Acc. Retail	256	2,861	3,117	24.00	29.26	28.74
Tires, batteries, & accessories	42	359	401	3.96	3.67	3.70
Gas & service stations	70	636	706	6.58	6.51	6.51
Car dealers	88	944	1,031	8.23	9.65	9.51
Car repair	47	727	774	4.42	7.44	7.14
Car & truck rental	9	195	204	0.80	1.99	1.88
Total National Employment	12,572	117,914	130,486			
Hwy Employment/National Employment (%)	8.492	8.291	8.311			
Highway Employment per 1,000 population	40.14	39.12	39.22			

equipment by the United States at the expense of highway construction and maintenance labor, or fewer people employed in the United States because of reduced maintenance and repair of the U.S. system.

Highway Fatalities. About 44,000 U.S. residents were killed in highway crashes in 1990; this figure has been declining annually in recent years. (See table 24.) In Canada, 3,600 people died in 1990. The death rate in the United States is higher than in Canada relative to the countries' respective populations—178 deaths per million in the United States versus 135 in Canada. Viewed in relation to the number of vehicles, the fatality statistics in the two countries are more similar—212 deaths per million vehicles in Canada compared to 230 in the United States. The higher U.S. rates are not surprising. Canada has relatively fewer motor vehicles, and they are driven less frequently on an annual basis than is the case in the United States. This information suggests that Canadian exposure rates, or the Canadian highway accident potential, would be less than that of the United States.

Table 24 Highway Fatalities: 1990

	Number of Fatalities			Percent of Fatalities		
	Canada	U.S.	Total	Canada	U.S.	Total
Total Highway	3,603	44,475	48,078	100.00	100.00	100.00
Occupants	2,917	37,134	40,051	80.96	83.49	83.30
Cars	n/a	24,092	n/a	n/a	n/a	n/a
Trucks	n/a	9,306	n/a	n/a	n/a	n/a
Motorcyclists	258	3,244	3,502	7.16	7.29	7.28
Buses	n/a	55	n/a	n/a	n/a	n/a
Other or unknown	n/a	437	n/a	n/a	n/a	n/a
Pedestrians	580	6,482	7,062	16.10	14.57	14.69
Pedalcyclists	106	859	965	2.94	1.93	2.01
Highway fatalities per million population	135	178	174			
Highway fatalities per million vehicles	212	230	229			

n/a Not available for this report

Aviation

The aviation, or air, mode consists of airways and airports; airplanes; helicopters; and other flying craft for carrying passengers and cargo.

Aviation Bill. The most important part of the aviation bill is expenditures for air carrier services. (See table 25.) Revenues from carrying domestic passengers are over half the total bill in the United States and a lesser amount (44 percent) in Canada; in both countries, however, this is the largest single figure in the respective aviation bills. The second most important category in the aviation bill, other civil aviation, refers to the business and recreational operations of private and corporate aircraft (known as general aviation). The aviation bill also contains expenditures on airports and airways and on government aviation research and development.

On a per capita basis, Canadians spend less on aviation than U.S. residents—$288 versus $350. Air carrier revenues for international passenger services are higher in Canada by a substantial margin—$98 versus $55 per person.

Airports and Airways. Both Canada and the United States have numerous airports—about 6,000 and 17,000, respectively.[2] However, the majority of these facilities are suited for use only in times of good visibility. Also, many are private and not regularly open to the public. The subset of airports in both countries that are open to the public, and the still smaller subset of airports suitable for use by passenger air carriers (i.e., flying craft with more than 30 seats), are totaled in table 26. Canada has many more airports relative to its population than does the United States; however, in relation to the countries' nearly equal land area, the U.S. numbers are almost twice that of Canada.

For safe operation, air transport also requires airways involving navigation equipment and air traffic control systems. Both the United States and Canada have radar control systems, although more of the U.S. air space is covered by traffic control than is the case for Canada. Commercial air carriers almost always fly under air traffic control conditions, but such control is not necessary for all aircraft operations. Fewer than half of all U.S. general aviation flights are made under air traffic control.

Number of Aircraft. Canadian airlines and general aviation both have fewer active aircraft and fewer active aircraft per capita than does the United States. (Table 26.) Canadian air carriers appear to operate fewer jet and piston aircraft per capita than do U.S. air carriers, but more than twice as many turboprop aircraft per capita. The Canadian air carrier fleet averages far fewer

Table 25 **Total and per Capita Aviation Bills: 1990**

	Millions of U.S. Dollars			Millions of Canadian Dollars		
	Canada	U.S.	Total	Canada	U.S.	Total
Aviation Bill:	7,666	90,699	96,819	8,946	104,042	112,988
Air carriers	7,026	76,874	83,901	8,200	89,712	97,912
Domestic passenger revenue	3,344	49,506	52,850	3,903	57,774	61,676
Domestic freight revenue	458	10,100	10,558	535	11,787	12,321
International passenger rev.	2,617	13,632	16,249	3,054	15,909	18,962
Intl. freight revenue	313	3,612	3,925	365	4,215	4,581
Other flying operations	32	n/a	32	37	n/a	n/a
Air carrier subsidy	262	24	286	306	28	334
Other civil aviation	637	11,943	12,580	743	13,938	14,681
Expense	637◄	10,398◄	11,035◄	743◄	12,134◄	12,877◄
Private aviation subsidy	n/a	1,545	1,545	n/a	1,803	1,803
Govt. operations minus revenue	3	1,881	1,884	4	2,195	2,199
Federal	3	661	664	4	771	775
State or province & local	n/a	1,220	1,220	n/a	1,424	1,424
Government average R & D	3	889	892	3	1,037	1,040

	U.S. Dollars			Canadian Dollars		
	Canada	U.S.	Total	Canada	U.S.	Total
Aviation Bill per Capita	288	363	350	336	416	409
Air carriers	264	308	303	308	359	354
Dom. passenger revenue	126	198	191	147	231	223
Dom. freight revenue	17	40	38	20	47	45
International passenger revenue	98	55	59	115	64	69
International freight revenue	12	14	14	14	17	17
Other flying operations	1	0	1	0	n/a	n/a
Air Carrier subsidy	10	0	1	12	0	1
Other civil aviation	24	48	45	28	56	53
Expense	24◄	42◄	40◄	28◄	49◄	47◄
Private average subsidy	n/a	6	6	n/a	7	7
Govt. operations minus revenue	n/a	8	7	n/a	9	8
Federal	0	3	2	0	3	3
State or province & local	n/a	5	4	n/a	6	5
Government average R & D	0	4	3	0	4	4

◄ Denotes estimate

n/a Not available for this report

seats per aircraft than the U.S. fleet. Per capita, Canada has fewer operational general aviation aircraft than the United States of each type except rotary wing aircraft.

Aircraft Use. The U.S. aviation mode carries more passenger- and more weight-distance, on both an absolute and per capita basis, than does Canadian aviation. (See table 27.) Canadian air passenger domestic travel per capita is less than half that of the United States; however, its international air travel per capita is more than twice that of the United States. As with per capita passenger travel, domestic goods air travel per capita is less than half that of the United States. Canadian and U.S. international goods travel per capita are similar.

Aviation Fuel Consumption. Canadians consume far less aviation fuel per capita than do U.S. citizens. (See table 28.)

Table 26 **Extent of aviation system: 1990**

	Number			Number/Million Population		
	Canada	U.S.	Total	Canada	U.S.	Total
Fixed-wing public airports	2,500	5,078	7,578	94	20	27
Certificated air carrier airports	400	650	1,050	15	3	4
	Number			**Aircraft/Million Population**		
	Canada	**U.S.**	**Total**	**Canada**	**U.S.**	**Total**
Total aircraft	16,121	218,640	234,761	606	875	849
Fixed wing	14,639	204,159	218,798	550	817	791
Rotary wing	950	7,481	8,431	36	30	30
Other	532	7,000	7,532	20	28	27
Air Carrier Aircraft*	641	6,483	7,124	24	26	26
Fixed wing	641	6,402	7,043	24	26	25
Jet	263	4,277	4,540	10	17	16
Turbo	318	1,191	1,509	12	5	5
Piston	60	934	994	2	4	4
Rotary wing	n/a	81	81	0	0	0
General aviation aircraft*	15,480	212,157	227,637	582	849	823
Fixed wing	13,998	197,757	211,755	526	791	766
Other commercial	2,937	32,830	35,767	110	131	129
Private	10,880	161,909	172,789	409	648	625
Other general aviation	181	3,018	3,199	7	12	12
Rotary wing	950	7,400	8,350	36	30	30
Other	532	7,000	7,532	20	28	27

Notes

n/a Not available for this report

* Canada and the U.S. classify aviation somewhat differently. For comparison purposes, the following definitions were used:
- Canadian air carriers are Level I and Level II Canadian air carriers, other civil aviation is "General Aviation."
- U.S. air carriers include regional and commuter airlines, "General Aviation" excludes all regional and commuter aircraft. Under general aviation, "other commercial" includes: instructional, aerial application, air taxi, and other work. Private aviation includes: corporate, business and personal flying.

	Person-Miles Millions			Person-Kilometers Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	42,590	476,034	518,625	68,528	765,939	834,467
Total domestic	16,448	360,934	377,383	26,466	580,743	607,209
Air carrier*	15,356	344,800	360,156	24,708	554,783	579,491
Other civil aviation	1,092◄	16,134	17,226◄	1,758◄	25,960	27,717◄
International air carrier	26,142	115,100	141,242	42,062	185,196	227,258

	Person-Miles per Capita			Person-Kilometers per Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	1,601	1,905	1,876	2,576	3,065	3,018
Total domestic	618	1,444	1,365	995	2,324	2,196
Air carrier*	577	1,380	1,303	929	2,220	2,096
Other civil aviation	41◄	65	62	66◄	104	100
International air carrier	983	461	511	1,581	741	822

	Ton-Miles Millions			Tonne-Kilometers Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	1,202	17,760	18,962	1,755	25,935	27,690
Domestic air carrier*	375	10,420	10,795	548	15,217	15,765
International air carrier	827	7,340	8,166	1,207	10,718	11,925

	Ton-Miles per Capita			Tonne-Kilometers per Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	45	71	69	66	104	100
Domestic air carrier*	14	42	39	21	61	57
International air carrier	31	29	30	45	43	43

Notes

◄ Denotes estimate

* Level I, II, III, & IV Canadian air carriers; U.S. includes larger regional-commuter carriers.

Aviation Employment. The largest categories of employment in air transportation are aviation equipment manufacture and aviation operations (mainly air carrier services). These categories constitute 93 percent of the one and a half million U.S. air employees and 94 percent of the 125,000 Canadian air employees. (See table 29.) Aircraft and engine manufacturing is a relatively more important aspect of U.S. air employment than of Canadian. In Canada, the reverse is true, and the majority of those in air transport work in aviation operations.

Aviation Fatalities. Aviation fatality rates per capita are similar for Canada and the United States. (See table 30.) In both countries, general aviation accounts for the majority of aviation fatalities.

Table 28 Aviation Fuel Consumption: 1990

	Gallons, Millions			Liters, Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	1,310	17,495	18,805	4,960	66,219	71,179
Air Carrier *	1,253	16,254	17,507	4,744	61,522	66,265
Turbine fuel	1,217	16,251	17,468	4,605	61,510	66,115
Gasoline	37	3	40	139	11	150
Other civil aviation	84◄	1,241	1,325	318◄	4,697	5,015
Turbine fuel	57◄	843	900	216◄	3,191	3,407
Gasoline	27◄	398	425	102◄	1,506	1,608

	Gallons per Capita			Liters per Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	49	70	68	186	265	257
Air Carrier *	47	65	63	178	246	240
Turbine fuel	46	65	63	173	246	239
Gasoline	1	0	0	5	0	1
Other civil aviation	3	5	5	12	19	18
Turbine fuel	2	3	3	8	13	12
Gasoline	1	2	2	4	6	6

◄ Denotes estimate

* Canadian Air Carriers include international and domestic level I, II, III, and IV carriers. U.S. air carriers include international and domestic air carriers, excluding small Regional and Commuter Carriers.

Table 29 Aviation Employment: 1990

	Employment (thousands)			Percent of Total Aviation Employment		
	Canada	U.S.	Total	Canada	U.S.	Total
Grand Total	125	1,537	1,662	100.00	100.00	100.00
Aviation equipment manufacturers	47	692	739	37.89	44.99	44.46
Aviation operations	70	741	811	56.02	48.23	48.82
Air carriers*	56	546	603	45.12	35.53	36.25
Other air carrier	4	92	96	3.49	5.97	5.79
Other commercial	9◄	103◄	113◄	7.41◄	6.73◄	6.78◄
Airports and Services**	8	104	112	6.09	6.78	6.73
Total national employment	12,572	117,914	130,486			
Aviation empl./national employment (%)	0.993%	1.304%	1.274%			
Aviation empl. per 1,000 population	4.69	6.15	6.01			

◄ Denotes estimate

* Canada and the U.S. classify aviation differently. Canadian Air Carriers as used above include: scheduled and unscheduled Level I, II, III and IV carriers. The U.S. air carrier figure represents all air carriers including Regional and Commuter Carriers.

** The federal government in Canada owns and operates about 100 civil airports. The figures shown exclude Canadian governmental employees.

	Fatalities			Fatalities/Million Population		
	Canada	U.S.	Total	Canada	U.S.	Total
Total aviation	87	838	925	3.27	3.35	3.35
Air carriers*	0	43	43	0.00	0.17	0.16
General aviation*	87	795	882	3.27	3.18	3.19

* Canada and the U.S. classify aviation somewhat differently. For comparison purposes, the following definitions were used:
–Canadian air carriers are Level I and Level II Canadian air cariers, other civil aviation is "General Aviation."
–U.S. Air Carriers include regional and commuter airlines. "General Aviation" excludes all regional and commuter aircraft. In general aviation, "other commercial" includes: instructional, aerial application, air taxi, and other work. Private aviation includes: corporate, business and personal flying.

Rail

The rail mode consists of freight and passenger (including commuter) railroads. Commuter rail statistics are also presented in the transit mode profile of this section.

Rail Bill. Although the U.S. railroad bill is over six times that of Canada's, Canadians spend over one and a half times as much per capita on rail services overall—and freight rail in particular—as do U.S. residents. (See table 31.) Both U.S. and Canadian intercity rail passenger services are supported by their respective governments. Even when this government support is included, Canadians continue to pay more per capita than do U.S. residents for intercity rail passenger services.

Extent of Rail Service. Canada and the 48 contiguous states of the United States have an interconnected network of railroads; the Alaskan Railroad is connected to the rest of the network by seagoing barges which carry rail cars. Although Canada and the United States have similar land areas, the United States has over three times the amount of track as does Canada. (See table 32.) Per capita, however, Canada has more than twice the amount of track as does the United States. Canadian rail track figures include 844 kilometers (796 miles) of mainline track owned and operated by Canadian railroads in the United States. These lines extend as far south as Louisville, Kentucky.

Canadian rail passenger services operate on about 12,900 kilometers (about 8,000 miles) of track, compared with U.S. operations which are over 38,600 kilometers (about 24,000 miles) of track. On the other hand, Canada's far smaller population spread over approximately the same land area as the United States means that there are more persons per track distance in the United States than in Canada. Canada has three times as much track as does the United States relative to its population.

Intercity rail passenger service is dominated by the quasi-public corporations, Amtrak and Rail Via Canada. In both Canada and the United States, most of the trackage used for passenger services is maintained and operated by freight railroads.

Number of Vehicles. Canada has more freight locomotives and fewer freight cars per capita than does the United States. (See table 33.) Canada averages about 40 cars per locomotive; the United States averages about 52. Canada has 11 times as many intercity rail passenger locomotives per capita as does the United States; it also has more than five times the number of intercity rail passenger cars. Canada averages about four intercity rail passenger cars per intercity rail locomotive compared to six for the United States.

Rail Vehicle Use. Canada has roughly one and a half times the freight travel per capita—and per freight car—as does the United States. (See table 34.) Canada's greater rail freight output, as measured by weight-distance of freight per freight car—is probably due to the transportation

Table 31 **Total and per Capita Rail Bills: 1990**

	Millions of U.S. Dollars			Millions of Canadian Dollars		
	Canada	U.S.	Total	Canada	U.S.	Total
Railroad Bill	6,056	36,754	42,810	7,067	42,891	49,958
Freight revenues	5,130	30,056	35,186	5,987	35,075	41,062
Subsidy	141	2,434	2,575	165	2,840	3,005
Federal	141	1,188	1,329	165	1,386	1,551
Other	n/a	1,246	1,246	n/a	1,454	1,454
Intercity passenger revenues	188	1,719	1,907	219	2,006	2,225
Federal subsidy*	378	584	963	442	682	1,124
Commuter pass. revenue	45◄	952	997◄	52◄	1,111	1,163◄
Subsidy	39◄	986	1,025◄	45◄	1,151	1,196◄
Other revenues	134	n/a	134	156	n/a	156
Unallocated subsidy	1	22	23	1	25	26

	U.S. Dollars			Canadian Dollars		
	Canada	U.S.	Total	Canada	U.S.	Total
Railroad Bill per Capita	228	147	155	266	172	181
Freight revenues	193	120	127	225	140	149
Subsidy	5	10	9	6	11	11
Federal	5	5	5	6	6	6
Other	n/a	5	5	n/a	6	5
Intercity passenger revenue	7	7	7	8	8	8
Federal subsidy*	14	2	3	17	3	4
Commuter pass. revenue	2	4	4	2	4	4
Subsidy	1	4	4	2	5	4
Other revenue	5	0	0	6	n/a	1
Unallocated subsidy	0	0	0	0	0	0

Notes
◄ Denotes estimate
n/a Not available for this report
* Reflects only Canadian VIA rail subsidy, there may be others.

Table 32 **Extent of Rail System: 1990**

	Miles			Kilometers		
	Canada	U.S.	Total	Canada	U.S.	Total
National rail track operational	53,996	177,274	231,270	86,880	285,234	372,114
Track per million population	2,030	709	836	3,266	1,141	1,346
Intercity passenger services*	8,390	24,000	32,390	13,500	38,616	52,116
per million population	315	96	117	508	155	188
Commuter service*	n/a	5,895	n/a	n/a	9,486	n/a
per million population	n/a	24	n/a	n/a	38	n/a

n/a Not available for this report
* Part of the national rail track.

characteristics of much of the freight (bulk shipments of dense agricultural and mineral products) and the long distances commodities are often transported to the coasts for export.

Rail Fuel Consumption. Petroleum-based fuel accounts for the vast majority of energy used in both the Canadian and U.S. rail systems. (See table 35.) Freight rail, as opposed to passenger rail, accounts for most of this consumption in both countries. The U.S. per capita consumption of electricity for rail passenger service far exceeds that of Canada; this is because the Northeast Corridor is an electrified rail passenger line.

Rail Employment. Per capita, Canada has almost three times the number of rail freight operations employees and about two times the number of intercity rail passenger service employees as does the United States. (See table 36.) The United States has over twice as many commuter rail employees as does Canada.

Rail Fatalities. Interestingly, although U.S. rail activity per capita is less than that in Canada, rail fatalities per capita are greater in the United States than in Canada (See table 37.)

Table 33 **Rail Vehicles: 1990**

	Vehicles			Vehicles per Million Residents		
	Canada	U.S.	Total	Canada	U.S.	Total
Total rail vehicles	128,156	1,242,171	1,370,327	4,818	4,971	4,956
Freight locomotives	3,426	23,181	26,607	129	93	96
Freight cars	123,137	1,212,261	1,335,398	4,629	4,851	4,830
Intercity passenger locomotives	293	318	611	11	1	2
Intercity passenger cars	1,088	1,996	3,084	41	8	11
Transit commuter cars	212◂	4,415	4,627◂	8◂	18	17◂

◂ Denotes estimate

Table 34 **Rail Person- and Weight-Distances 1990**

	Ton-Miles			Tonne-Kilometers		
	Canada	U.S.	Total	Canada	U.S.	Total
Freight, millions	170,080	1,071,000	1,241,080	248,371	1,564,000	1,812,370
Per freight car	1,381,226	883,473	929,371	2,017,028	1,290,151	1,357,176
Per capita	6,394	4,286	4,489	9,337	6,259	6,555
Intercity passenger millions	1,246	6,125	7,371	2,004	9,855	11,859
Per passenger car	1,144,961	3,068,637	2,389,986	1,842,243	4,937,437	3,845,488
Per capita	47	25	27	75	39	43
Transit commuter, millions	305◂	7,082	7,387◂	491◂	11,395	11,886◂
Per commuter car	1,438,208◂	1,604,077	1,596,477◂	2,314,076◂	2,580,960	2,568,732◂
Per capita	11◂	28	27◂	18◂	46	43◂

◂ Denotes estimate

Table 35 **Rail Fuel Consumption: 1990**

	Diesel Gallons Equivalent			Diesel Liters Equivalent		
	Canada	U.S.	Total	Canada	U.S.	Total
Total rail, millions	552	3,403	3,955	2,089	12,881	14,970
Petroleum	552	3,364	3,916	2,089	12,733	14,822
Electric	0	39	39	0	148	148
Freight, millions	518	3,227	3,746	1,962	12,215	14,177
Diesel	485	3,227	3,712	1,835	12,215	14,051
Crude	33	0	33	126	0	126
Electric	0	0	0	0	0	0
Per capita petroleum	19	13	14	74	49	51
Passenger, millions	34	176	210	127	666	793
Intercity passenger, millions	27	90	117	103	341	444
Diesel	27	82	109	103	311	413
Electric	0	8	8	0	31	31
Commuter passengers	7	86	92	25	325	349
Diesel	7	55	61	25	207	232
Electric	0	31	31	0	117	117
Passengers per capita petroleum	1	1	1	5	2	2
Passengers per capita electric	0	39	39	0	148	148

Table 36 **Rail Employment: 1990**

	Employees (thousands)			Employees per million Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Total Rail	76	651	727	2,863	2,606	2,631
Rail equipment manufacturers	6	374	380	226	1,497	1,374
Rail operations	70	277	347	2,638	1,109	1,256
Rail freight	64	232	296	2,415	927	1,071
Rail passengers	6	45	51	223	182	186
Intercity	5	24	29	183	96	104
Commuter	1	21	22	39	86	81
Percent of National Employment	0.61	0.55	0.56			

Table 37 **Rail Fatalities: 1990**

	Fatalities			Fatalities per million Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Total Rail*	103	1297	1400	3.87	5.19	5.06
Rail	56	599	655	2.11	2.40	2.37
Grade crossing	47	698	745	1.77	12.79	2.69

* Includes rail-rail collisions, persons struck on track and "other."

Water

The water mode consists of navigable rivers, canals, the Great Lakes, the St. Lawrence Seaway, the Intercoastal Waterway, ocean shipping channels; ports; commercial ships and barges, fishing vessels, urban ferries, and recreational boats.

Water Bill. The total per capita expenditures on water transportation in Canada and the United States are similar. (See table 38.) According to industry figures, domestic boating represents the largest water expenditure item per capita in both countries. Canadians spend 36 percent more on domestic boating per capita than do U.S. residents. Canada spends less per capita on domestic water for-hire services than does the United States.

Extent of Water System. Of the two countries, the United States has the more extensive inland and intracoastal waterway system. Specifically, it has more than 32.180 kilometers (20,000 miles) of inland and intracoastal waterways with channel depths exceeding three meters (about nine feet). This system serves barge and other shallow draft vessels; extensive parts of it can handle multibarge floats. Canada's inland waterways are limited primarily to the Great Lakes–St. Lawrence River system, which serves oceangoing vessels as well as lakers and shallow draft vessels.

Vessel Fleets. Canada's commercial shipping fleet consists of 1,731 vessels; the U.S. fleet contains 37,762 vessels. (See table 39.) The composition of these fleets differs substantially. Canada has eight times the U.S. number of ocean-going ships, and 12 times the Great Lakes fleet, as measured in relation to population. The U.S. barge fleet, on the other hand—which is used primarily for inland waterway operation—is almost six times the size of Canada's fleet per capita.

Both countries have large numbers of recreational boats and fishing vessels, but on a per capita basis, Canada's fishing fleet exceeds the size of the U.S. fleet by a factor of almost five. The numbers of recreational boats—canoes, sailboats, rowboats, and powerboats—are more nearly equal. The U.S. figure of about 6 per 100 residents is about 73 percent of Canada's about 9 per 100.

Water Vehicle Use. Canadian domestic freight travel per capita is less than half that of the United States, although Canada spends more on such travel per capita. (See table 40.) Per capita, Canada may have more than twice the U.S. water freight export travel and almost three-quarters of its freight import travel.[3]

Water Fuel Consumption. The fuels consumed by boats and ships are gasoline (mainly for recreational boats) and diesel fuel (used primarily by commercial inland waterway and ocean-going vessels). Overall, gasoline use is about the same per capita in both Canada and the United States. (See table 41.) Canada, however, consumes more diesel fuel—a finding in line with that country's relatively larger commercial fleet. The per capita diesel fuel consumption in Canada is almost twice that of the United States.

Water Employment. The number of Canadian commercial water employees per capita is about three times that of the United States. (See table 42.) This large difference might be partially due to Canada's larger fleets of both Great Lakes and oceangoing vessels per capita, and larger international freight travel per capita.

Water Fatalities. Canadian water fatalities per capita are greater than those in the United States. (See table 43.) This difference is only partially accounted for by the larger number of recreational boats per capita in Canada.

Table 38 **Water Bill**

	Millions of U.S. Dollars			Millions of Canadian Dollars		
	Canada	U.S.	Total	Canada	U.S.	Total
Water Bill	3,982	37,677	41,659	4,647	43,969	48,616
Domestic	2,618	22,472	25,090	3,055	26,225	29,280
For-hire & business	599	8,772	9,371	699	10,237	10,936
Freight	476	7,156	7,631	555	8,351	8,906
Pass. including ferries	123	915	1,038	144	1,068	1,211
Federal subsidies		702	702		819	819
Boating[1]	1,971◄	13,700◄	15,671◄	2,300◄	15,988◄	18,288◄
International	1,009◄	14,724◄	15,732◄	1,177◄	17,183◄	18,360◄
International freight[2]	992◄	13,118◄	14,110◄	1,158◄	15,309◄	16,466◄
International passengers	17	1,375	1,391	19	1,604	1,624
Federal subsidy	n/a	231	231	n/a	270	270
Unallocated subsidies	355	481	836	415	561	976
Federal	355◄	*	355◄	415◄	*	415◄
State or province & local	**	481	481◄	**	561◄	561◄

	U.S. Dollars per Capita			Canadian Dollars per Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Water Bill	150	151	151	175	176	176
Domestic	98	90	91	115	105	106
For-hire & business	23	35	34	26	41	40
Freight	18	29	28	21	33	32
Passengers incl. ferries	5	4	4	5	4	4
Federal subsidies		3	3		3	3
Boating	74◄	55◄	57◄	86◄	64◄	66◄
International	38	59	57	44	69	66
International freight	37	52	51	44	61	60
International passenger	1	6	5	1	6	6
Federal subsidy		1	1	0	1	1
Unallocated subsidies	13	2	3	16	2	4
Federal	13◄	*	1◄	16◄	*	2◄
State or province & local	**	2◄	2◄	**	2◄	2◄

Notes

◄ Denotes estimate

n/a Not available for this report

* U.S. subsidies are all allocated

** The author did not find a source for Canadian provincial and local expenditures.

1. Boating figures are from the boat manufacturing trade associations in Canada and the United States.
2. Represents the shipping cost of imports only, which are generally paid for by U.S. or Canadian Interests.

Table 39 **Extent of Water System: 1990**

	Number			Vessels/Million Population		
	Canada	U.S.	Total	Canada	U.S.	Total
Vessels	2,360,720	15,951,106	18,311,826	88,749	63,830	66,227
Recreation boats	2,300,000	15,800,000	18,100,000	86,466	63,225	65,461
Canoes	667,000	2,300,000	2,967,000	25,075	9,204	10,731
Sailboats	230,000	1,300,000	1,530,000	8,647	5,202	5,533
Rowboats	253,000	2,200,000	2,453,000	9,511	8,804	8,872
Outboards	1,035,000	7,900,000	8,935,000	38,910	31,613	32,315
Inboards	115,000	2,100,000	2,215,000	4,323	8,403	8,011
Fishing vessels	58,329	113,000	171,329	2,193	452	620
>5 tons	18,341	36,000	54,341	690	144	197
Motorboats	38,000◄	75,000	113,000	1,429◄	300	409
Other	1,988	2,000	3,988	75	8	14
Commercial Shipping Fleet	1,731	37,762	39,493	65	151.3	143
Barges	587	30,966	31,553	22	124	114
Towboats/tugs	378	5,210	5,588	14	21	20
Ferries & passenger	216	1,116	1,332	8	4	5
Great Lakes fleet	108	77	185	4	0.31	1
Ocean-going	442	393	835	17	2	3
Other	876	1,460	2,336	33	6	9
For-hire	350	n/a	n/a	13	n/a	n/a
Private	74	n/a	n/a	3	n/a	n/a
Government	452	n/a	n/a	17	n/a	n/a

◄ Denotes estimate
n/a Not available for this report

Table 40 **Water Person- and Weight-Distances: 1990**

	Person-Miles, Millions			Person-Kilometers, Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Domestic ferries	564◄	2,902◄	3,466◄	908◄	4,669◄	5,576◄

	Person-Miles, Millions			Person-Kilometers, Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Domestic ferries	21◄	12◄	13◄	34◄	19◄	20◄

	Ton-Miles, Millions			Tonne-Kilometers, Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Domestic marine freight	37,854	811,000	848,854	55,279	1,184,317	1,239,596
Per capita	1,423	3,245	3,070	2,078	4,739	4,483
International marine freight[1]	1,024,614◄	5,435,180◄	6,459,794◄	1,496,262◄	7,937,086◄	9,433,348◄
Exports	793,666◄	2,543,180◄	3,336,847◄	1,159,005◄	3,713,849◄	4,872,854◄
Imports	230,948◄	2,892,000◄	3,122,948◄	337,257◄	4,223,236◄	4,560,494◄
Total per capita	38,519◄	21,749◄	23,363◄	56,250◄	31,761◄	34,117◄
Exports per capita	29,837◄	10,177◄	12,068◄	43,572◄	14,861◄	17,623◄
Imports per capita	8,682◄	11,573◄	11,295◄	12,679◄	16,900◄	16,494◄

◄ Denotes estimate

Table 41 Water Fuel Consumption: 1990

	Gallons, Millions			Liters, Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Total domestic water	540.5	3,365.4	3905.9	2,045.9	12,738.1	14,784.0
Diesel	390.2	2,065.0	2,455.2	1,476.8	7,816.0	9,292.8
Gasoline	150.4	1,300.4	1,450.8	569.1	4,922.0	5,491.2
	Gallons			**Liters**		
	Canada	U.S.	Total	Canada	U.S.	Total
Total per capita	20.32	13.47	14.13	76.91	50.97	53.47
Diesel	14.67	8.26	8.88	55.52	31.28	33.61
Gasoline	5.65	5.20	5.25	21.40	19.70	19.86
	Gallons, Millions			**Liters, Millions**		
	Canada	U.S.	Total	Canada	U.S.	Total
International residential & other	1,193.1◄	6,326.0◄	7,519.1◄	4,515.7◄	23,944.0◄	28,459.7◄
	Gallons			**Liters**		
	Canada	U.S.	Total	Canada	U.S.	Total
Residential & other per capita	44.85◄	25.31◄	27.19◄	169.76◄	95.81◄	102.93◄

◄ Denotes estimate

Table 42 Water Employment: 1990

	Employees, in thousands			Employees per million capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Total marine	42	348	390	1,586	1,391	1,410
Manufacturing & repair*	15	187	202	556	750	731
Ships	13	136	148	481	542	536
Boats	2	52	54	75	208	195
Marine operations	16	50	66	602	201	239
Services to marine	11	110	122	429	441	439
Percent of national employment	0.34	0.29	0.30			

Notes
* Manufacturing and repair statistics are industry totals and may include production for export or related business activities (for example, sales to the navy or coast guard).

Table 43 Water Fatalities: 1990

	Fatalities			Fatalities per Million Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Total water	390	919	1309	14.66	3.68	4.73
Water transport*	3	54	57	0.11	0.22	0.21
Recreational boating	387◄	865	1252	14.55◄	3.46	4.53

Notes
◄ Denotes estimate
* In Canada ferry boats only. The recreational boat value is the total less the water transport.

Transit

The transit mode is generally defined as urban and rural public transportation services—including commuter trains, ferry service, heavy rail (rapid rail) and light rail (streetcar) transit systems, and local transit buses—and taxis. Some aspects of the transit system are also discussed in other modal profiles in this section.

Transit Bill. In both Canada and the United States, federal, provincial/state, and local government support defrays a larger percentage of transit operating expenses than of any other mode of transportation. This support accounts for more than half the cost of providing transit service in both nations. (See table 44.)

Canada spends more per capita on transit than does the United States; its governmental units spend less on both operating and capital expenses per capita. Total government capital support per capita is 75 percent that of the United States. Provincial and local governments paid almost all the government capital support in Canada. The U.S. federal government pays a larger percentage of transit capital subsidies than does Canada's.

Extent of Transit System. Transit services in the United States and Canada exist in both metropolitan and raral areas. They are, however, particularly concentrated in metropolitan areas, where they can serve the majority of both countries' populations.[4] Canada has 77 transit systems; the United States has 787. In Canada, rapid rail and commuter rail transit are concentrated in two metropolitan areas—Toronto and Montreal. The United States has 12 heavy rail and 14 commuter rail systems; two of each of these serve New York. In fact, transit serving New York City accounts for more than 29 percent of U.S. total unlinked annual transit trips and an even greater percentage of the nation's transit passenger-distance.

Number of Vehicles. Canada has almost one and a half times as many active transit vehicles of every type—with a few exceptions, notably commuter rail vehicles—as does the United States on a per capita basis. (See table 45.) In general, Canada has relatively more light rail vehicles than the United States; the United States has significantly more commuter rail vehicles than Canada.

Transit Vehicle Use. In line with Canada's greater per capita transit bill (particularly revenue per capita) and greater per capita transit vehicle figures, Canada has much more transit travel per capita than does the United States.[5] (See table 46.) Per unit of transit travel, Canada has less expense, pays less government support, and receives more from fares than does the United States. (See table 47.) In both nations, the farebox revenues per unit of travel are substantially less than the cost of driving a car, and the total expenses (revenue plus government support) are substantially greater. Canada's farebox recovery ratio is higher than that of the United States. Canadian transit passengers pay relatively more than do the supporting governmental units.

Transit Fuel Consumption. In both the United States and Canada, the transit mode has tended to reduce overall transportation oil consumption. (See table 48.) In both countries, this mode provides roughly a third more passenger travel per unit of energy than does the automobile. Also in both countries, a larger percentage of the energy fueling transit—as opposed to fueling the automobile—comes from sources other than oil. Canada, with its more extensive use of transit, uses more transit fuel per capita than does the United States. Diesel and gasoline account for larger proportions of Canada's transit fuel than of U.S. transit fuel.

Transit Employment. The quarter of a million transit employees in Canada and the United States are employed predominantly in urban bus operations. (See table 49.) In fact, those who work for bus systems constitute 75 percent of all transit employees. The second most predominant transit employment is in heavy rail systems (such as those operated in New York City, Washington, D.C., and Montreal). The 51,000 people employed by these systems in both countries make up 20 percent of all transit workers.

Overall, Canada has more transit employees per capita than does the United States: one and a half per thousand population, compared to fewer than one (0.85). Per capita employment in the two countries is about equal for heavy rail systems. Canada has far greater relative employment in light rail and trolley systems (a not surprising development, given that these systems are much more common in Canada than in the United States). The United States has about two and a half times Canada's per capita employment in commuter rail operations. (Commuter rail systems exist in many eastern U.S. cities as well as in the Chicago area; they have recently been reestablished in California.)

Transit Fatalities. Transit fatalities in both Canada and the United States tend to be small. (See table 50.)

Table 44 Total and per Capita Transit Bills: 1990

	Millions of U.S. Dollars			Millions of Canadian Dollars		
	Canada	U.S.	Total	Canada	U.S.	Total
Transit bill	2,485	20,678	23,162	2,900	24,131	27,030
Total subsidy	1,361	14,752	16,113	1,589	17,216	18,804
Operating	2,095	15,742	17,837	2,445	18,371	20,815
Total revenue	1,123	5,885	7,008	1,311	6,867	8,178
Total subsidy	971	9,816	10,788	1,133	11,456	12,589
Motor bus[1]	1,444◄	9,421	10,865◄	1,685◄	10,994	12,679◄
Revenue	774◄	3,008	3,782◄	904◄	3,510	4,414◄
Subsidies	670◄	6,413	7,083◄	781◄	7,484	8,265◄
Heavy rail	387◄	3,825	4,212◄	452◄	4,464	4,915◄
Revenue	208◄	1,741	1,948◄	242◄	2,032	2,274◄
Subsidies	179◄	2,084	2,264◄	209◄	2,432	2,642◄
Light rail	125◄	237	362◄	146◄	277	422◄
Revenue	67◄	83	149◄	78◄	96	174◄
Subsidies	58◄	155	212◄	67◄	180	248◄
Trolleybus	56◄	109	164◄	65◄	127	192◄
Revenue	30◄	46	76◄	35◄	53	88◄
Subsidies	26◄	63	89◄	30◄	73	103◄
Commuter rail	83◄	1,939	2,022◄	97◄	2,262	2,360◄
Revenue	45◄	952	997◄	52◄	1,111	1,163◄
Subsidies	39◄	986	1,025◄	45◄	1,151	1,196◄
Ferryboat[2]	n/a	171	171	n/a	200	200◄
Revenue	n/a	56	56	n/a	65	65◄
Subsidies	n/a	116	116	n/a	135	135◄
Other[3]	n/a	41	41	n/a	48	48◄
Revenue	n/a	26	26	n/a	30	30◄
Subsidies	n/a	15	15	n/a	17	17◄
Capital subsidies	390	4,936	5,325	455	5,760	6,215
Federal	28	2,873	2,900	32	3,352	3,385
State or province	241	697	938	281	813	1,094
Local	121	1,177	1,298	141	1,373	1,515
Other assistance	n/a	189	189	n/a	221	221

	Canada	U.S.	Total
Subsidy percent of bill	54.78	71.34	69.57
Percent of total subsidy by:			
Federal	7.13	58.20	54.46
State or province	61.79	14.12	17.61
Local	31.08	23.85	24.38
Other assistance	0.00	3.84	3.55

	U.S. Dollars per Capita			Canadian Dollars per Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Transit bill per capita	93	83	84	109	97	98
Ops. & cap. subsidy	51	59	58	60	69	68
Operating expense	79	63	65	92	74	75
Total revenue	42	24	25	49	27	30
Total subsidy	37	39	39	43	46	46
Capital subsidies	15	20	19	17	23	22
Federal	1	11	10	1	13	12
State or province	9	3	3	11	3	4
Local	5	5	5	5	5	5
Other assistance	n/a	1	1	n/a	1	1

Notes

◄ Denotes estimate

n/a Not available for this report

1. Canadian figures include articulated buses. U.S. figures include response buses.
2. Canadian governments own and operate a number of ferryboats. They are accounted for in the water profile. The U.S. includes only those ferry operations subsidized by the federal government transit program, a small part of the total.
3. Canadian statistics included an "other" category without defining what it included. Therefore the revenues and costs for the category cannot be estimated.

Table 45 Transit Vehicles: 1990

	Number			Vehicles/Million Population		
	Canada	U.S.	Total	Canada	U.S.	Total
Total active vehicles	14,442	93,231	107,673	542.93	373.07	430.86
In-common types[1]						
Total active vehicles	13,997	75,293	89,290	526.20	301.29	357.30
Motor buses	10,560	58,714	69,274	396.99	234.95	277.21
Heavy railcars	1,379	10,419	11,798	51.84	41.69	47.21
Light railcars	527	913	1,440	19.81	3.65	5.76
Trolley-buses	272	832	1,104	10.23	3.33	4.42
Commuter rail	369	4,415	4,784	13.87	17.67	19.14
Unique to nation[2]						
Total active vehicles	445	17,938	18,383	16.73	71.78	66.48
Vanpool	n/a	929	929	n/a	3.72	3.36
Demand response	n/a	16,741	16,741	n/a	66.99	60.55
Ferryboats	n/a	108	108	n/a	0.43	0.39
Cable cars	n/a	44	44	n/a	0.18	0.16
Inclined plane	n/a	10	10	n/a	0.04	0.04
Aerial tramway	n/a	2	2	n/a	0.01	0.01
Auto-guideway	n/a	104	104	n/a	0.42	0.38
Type unknown	445	n/a	445	16.73	n/a	1.61

Notes
n/a Not available for this report
1. Types of vehicles defined as transit in both nations.
2. For the U.S., vehicles belonging to types of transit service not defined in Canadian statistical sources. These services account for about 5 percent of total U.S. transit expenditures. For Canada, vehicles reported as "other" account for roughly 3 percent of the total reported transit vehicles.

Table 46 Transit Person-Distances: 1990

	Passenger-Miles millions			Passenger-Kilometers millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	6,201	41,143	47,344	9,978	66,199	76,177
Motor buses	3,774◄	20,981	24,755◄	6,072◄	33,758	39,830◄
Heavy rail	1,288◄	11,475	12,763◄	2,072◄	18,463	20,535◄
Light rail	333◄	571	904◄	536◄	919	1,454◄
Trolley-buses	110◄	193	303◄	176◄	311	487◄
Commuter rail	698◄	7,082	7,780◄	1,123◄	11,395	12,518◄
Other	n/a	841	841◄	n/a	1,353	1,353◄
	Passenger-Miles per U.S. Dollar			**Passenger-Km per Canadian Dollar**		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	233◄	165	171◄	375◄	265	276◄
Motor buses	142◄	84	90◄	228◄	135	144◄
Heavy rail	48◄	46	46◄	78◄	74	74◄
Light rail	13◄	2	3◄	20◄	4	5◄
Trolley-buses	4◄	1	1◄	7◄	1	2◄
Commuter rail	26◄	28	28◄	42◄	46	45◄
Other	n/a	3	3◄	n/a	5	5◄

◄ Denotes estimate
n/a Not available for this report.

Table 47 Transit Revenues: 1990

	Average Operating Revenues per Passenger-Mile			Average Operating Revenues per Passenger-Kilometer		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	0.18◄	0.14	0.15	0.13	0.10	0.11
Motor buses	0.21◄	0.14	0.15◄	0.15	0.10	0.11◄
Heavy railcars	0.16◄	0.15	0.15◄	0.12◄	0.11	0.11◄
Light railcars	0.20◄	0.14	0.17◄	0.15◄	0.10	0.12◄
Trolley-buses	0.27◄	0.24	0.25◄	0.20◄	0.17	0.18◄
Commuter rail	0.06◄	0.13	0.13◄	0.05◄	0.10	0.09◄
Ferries	n/a	0.19◄	n/a	n/a	0.23	n/a
Other	n/a	0.33◄	n/a	n/a	0.38	n/a

	U.S. Dollars Avg. Subsidy/Pass.-mi.			Canadian Dollars Avg. Ops. Revenue/Pass.-km		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	0.40	0.50	0.49	0.29	0.36	0.35

	U.S. Dollars Avg. Expense/Pass.-mi.			Canadian Dollars Avg. Ops. Expense/Pass.-km		
	Canada	U.S.	Total	Canada	U.S.	Total
Total	0.58	0.65	0.64	0.42	0.47	0.46

◄ Denotes estimate
n/a Not available for this report

Table 48 Transit Fuel Consumption: 1990

	Gallons Equivalent Millions			Liters Equivalent Millions		
	Canada	U.S.	Total	Canada	U.S.	Total
Total fuels	113.73	844.88	958.61	430.46	3,197.88	3,628.34
Gasoline	3.98	33.91	37.89	15.06	128.33	143.40
Diesel	94.45	615.95	710.40	357.48	2,331.38	2,688.86
Natural gas or propane	0.24	0	0.24	0.92	0	0.92
Electricity	15.06	195.02	210.08	56.99	738.17	795.16
Fuels by mode	113.73◄	844.88	958.61◄	430.46◄	3,197.88	3,628.34◄
Motor buses	94.43◄	597.06	691.49◄	357.43◄	2,259.87	2,617.30◄
Gasoline	3.98◄	33.91	37.89◄	15.06◄	128.33	143.40◄
Diesel	90.21◄	563.15	653.36◄	341.45◄	2,131.53	2,472.98◄
Natural gas or propane	0.24◄	0	0.24◄	0.92◄	0	0.92◄
Heavy rail, electricity	9.53◄	131.13	140.66◄	36.07◄	496.32	532.39◄
Light rail, electricity	3.53◄	11.14	14.67◄	13.37◄	42.15	55.52◄
Trolley-buses, electricity	0.52◄	2.93	3.45◄	1.98◄	11.08	13.05◄
Commuter rail	5.71◄	102.51	108.22◄	21.61◄	388.02	409.63◄
Diesel	4.24◄	52.68	56.92◄	16.03◄	199.40	215.43◄
Electricity	1.47◄	49.83	51.31◄	5.58◄	188.62	194.20◄
Other, diesel	n/a	0.12	0.12◄	n/a	0.45	0.45◄

	Gallons Equivalent per Capita			Liters Equivalent per Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Total transit fuel	4.28	3.38	3.47	16.18	12.80	13.12
Gasoline and diesel	3.70	2.60	2.71	14.01	9.84	10.24
Other	0.58	0.78	0.76	2.18	2.95	2.88
%"Other" fuels of total	13.45	23.08	21.94	n/a	n/a	n/a

	Passenger-Miles/Gallon			Passenger-Kilometers/Liter		
	Canada	U.S.	Total	Canada	U.S.	Total
All fuel	54.53	48.70	49.39	23.18	20.70	20.99

◄ Denotes estimate
n/a Not available for this report.

Table 49 Transit Employment: 1990

	Employees			Employees per Million Population		
	Canada	U.S.	Total	Canada	U.S.	Total
Transit Employees	39,585◄	212,357	251,942◄	1,488◄	850	911◄
Motor buses[1]	27,042◄	162,189	189,231◄	1,017◄	649	684◄
Heavy railcars	4,801◄	46,102	50,903◄	180◄	184	184◄
Light railcars	2,202◄	4,066	6,268◄	83◄	16	23◄
Trolley-buses	1,008◄	1,925	2,933◄	38◄	8	11◄
Commuter rail	956◄	21,443	22,399◄	36◄	86	81◄
General & administration	3,576	10,633	14,209	134	43	51◄
Unique to nation[2]	n/a	17,870	n/a	n/a	72	n/a
Demand response	14,159	57	n/a	n/a	n/a	n/a
Vanpool	78	0	n/a	n/a	n/a	n/a
Ferries	2,813	11	n/a	n/a	n/a	n/a
Misc.	n/a	820	n/a	n/a	3	n/a

Notes
◄ Denotes estimate
n/a Not available for this report.
1. Data varies from province to province in Canada, and from state to state in the U.S.
2. The U.S. has federal programs for classes of transit not defined in the Canadian statistical sources. Demand response is defined as: non-fixed-route service using vans or buses with passengers boarding or alighting at prearranged times and locations. Vanpool is defined as a service in which passengers share a van with a passenger designated as the "driver." The origin-destination pattern is generally fixed, but changes as passengers change. Canadian ferry statistics are covered in the marine profile. In the U.S. miscellaneous includes San Francisco's cable cars, four inclined plane systems, the Roosevelt Island aerial tramway in New York City, the Seattle monorail, and seven automated guideway systems. Neither Statistics Canada or the Canadian Urban Transit Association sources defined their "other" class.

Table 50 Transit Fatalities: 1990

	Fatalities			Fatalities per Million Capita		
	Canada	U.S.	Total	Canada	U.S.	Total
Total Transit						
Heavy rail	n/a	69	n/a	n/a	0.28	n/a

n/a Not available for this report.

Oil Pipeline

The pipeline mode covers crude oil, petroleum product, and gas trunk lines. The pipeline industry, which transports oil and petroleum products, is an important—if specialized—freight mode.[6] Unfortunately, data for this mode are incomplete and, in some cases, unavailable.

The oil pipeline bill for operations in Canada and the United States totaled $9.2 billion in 1990. (See table 51.) This amount is approximately equal to the domestic water transportation bill of $9.4 billion. Pipelines are capital-intensive, employing a rather small number of people—22,000; this figure is less than a third the number employed in water operations and about the same as the number employed in commuter rail services. The geographic extent of pipelines is great: The approximately 378,000 kilometers (235,000 miles) of crude oil and oil products pipelines for the two countries exceed the about 371,000 kilometers (231,000 miles) of their railroads.

On a per capita basis, the data for Canada and the United States are quite similar, with a per capita pipeline bill for Canada of $31, versus $34 in the United States. The extent of the total pipeline system in terms of the countries' respective populations is equal within a few percentage points. Per capita employment is 74 per thousand in Canada and 80 per thousand in the United States.

Table 51 Oil Pipeline Overview: 1990

	U.S. Measures			Canadian Measures		
	Canada	U.S.	Total	Canada	U.S.	Total
Transport Bill						
(millions of dollars)	838	8,387	9,225	978	9,788	10,765
Extent (miles/kilometers)	21,795	213,535	235,330	35,073	343,578	378,651
Crude[1]	18,594	125,553	144,147	29,923	202,015	231,938
Product	3,200	87,982	91,182	5,150	141,563	146,713
Ton-miles or tonne-kilometers						
(in millions)	70,302	584,000	654,302	121,770	1,011,542	1,133,312
Average yield, cents	1.19	1.48	1.41	0.80	0.97	0.95
Employment	1,959	20,000	21,959	1,959	20,000	21,959
Average salary	47,258	43,632	43,956	55,151	50,919	51,296
Fatalities	n/a	3	n/a	n/a	3	n/a
Oil pipeline per capita						
Bill, (dollars)	31	34	33	37	39	39
Extent, miles or kilometers, per million	819	854	851	1,319	1,375	1,369
Crude*	699	502	521	1,125	808	839
Product	120	352	330	194	566	531
Performance ton-miles or						
Cubic M-km, per million	2,643	2,337	2,366	4,578	4,048	4,099
Employment, per million	74	80	79	74	80	79
Fatalities, per million	n/a	0.012	n/a	n/a	0.012	n/a

Notes
n/a Not available for this report.
* includes trunk and gathering lines.

Endnotes

1. This includes local transit buses.
2. These figures include heliports, STOLports, and seaports as well as conventional airports.
3. These international freight travel figures are estimates using 1992 Canadian statistics; the U.S. figures are based on U.S. tonnages, loaded and unloaded, multiplied by Canadian average distances for exports and imports.
4. About 61 percent of all Canadians (16.7 million) live in 25 metropolitan areas. Roughly 78 percent of U.S. citizens (193 million) live in 335 metropolitan areas.
5. Note that the travel estimates for the individual modes of Canadian transit were based in part on U.S. travel-per-vehicle experience. The estimate totals do conform, however, to reported Canadian totals on revenue, expenses, trips, and fares.
6. Natural gas pipelines constitute an additional specialized freight mode; these are not covered in this report, however.